Warmer is better for an invasive frog species

PADILLA Pablo[1,2*], Anthony HERREL[2,3], Mathieu DENOËL[1,4]

[1]. Laboratory of Ecology and Conservation of Amphibians (LECA), Freshwater and OCeanic science Unit of reSearch (FOCUS), University of Liège, Liège, Belgium.

[2]. UMR 7179 C.N.R.S/M.N.H.N., Département Adaptations du Vivant, Paris, France.

[3]. Evolutionary Morphology of Vertebrates, Ghent University, Ghent, Belgium.

[4]. Fonds de la Recherche Scientifique – FNRS, Belgium.

*Corresponding author: pablo.padilla@uliege.be

Global warming and temperature variation caused by anthropogenic mediated climate change are impacting organisms world-wide. Despite the fact that the strongest species declines have been observed in amphibians, some introduced exotic amphibians have been able to quickly adapt to new environmental conditions. Because the interaction between the effects of these invaders and climate change could lead to unprecedented loss to native populations, gathering knowledge on how these invaders might benefit from warmer temperatures is needed to assess future threats.

We here investigate if an overlooked invasive frog species, marsh frogs (Pelophylax ridibundus), will benefit from warmer temperature in its invasive range (Southern France). To do so we evaluated multiple physiological traits to temperature and determined the thermal preference, optimum, and limits of this species in relation to the temperature observed in their invasive range.

Results show that marsh frogs have a broad thermal tolerance with thermal preference and optima of performance at temperature higher than the current average temperature in their habitat.

Warmer climate may have already favoured the invasion of marsh frogs and, given the current predictions, will undoubtedly continue to do so.